Electronic Version
Stylesheet Version v1.1.1

Claims

[c1] A progressive stamping die for forming a product from a work piece comprising:
a first die member;
a second die member;
an alignment mechanism for maintaining said first and second die members in axial alignment;
a pierce punch member in said first die member for punching an opening in a work piece positioned between said first and second die members;
at least one pilot member in said first die member for indexing a work piece positioned between said first and second die members;
a coin punch member in said first die member for forming a product from a work piece positioned between said first and second die member;
a biasing member in said second die member in axial alignment with said coin punch member; and
a knockout punch member for removing a product from a work piece positioned between said first and second die member.

[c2] A progressive stamping die for forming a product from a

work piece in claim 1 wherein said biasing member comprises a gas spring member.

[c3] A progressive stamping die for forming a product from a work piece in claim 1 wherein said biasing member comprises a mechanical spring member.

[c4] A progressive stamping die for forming a product from a work piece in claim 1 further comprising an anvil member positioned adjacent said biasing member and in axial alignment with said coin punch member.

[c5] The progressive stamping die for forming a product from a work piece in claim 4 wherein said anvil member comprises a puck member, a bottoming disk member, a bottoming ring member, and a return pin member.

[c6] The progressive stamping die for forming a product from a work piece in claim 1 further comprising a scrap chute in said second die member at least in part in axial alignment with said pierce punch member.

[c7] The progressive stamping die for forming a product from a work piece in claim 1 further comprising a product collection chute in said second did member at least in part in axial alignment with said knockout punch member.

[c8] A progressive stamping die for forming a plurality of

products from a work piece comprising:
a first die member;
a second die member;
an alignment mechanism for maintaining said first and second die member in axial alignment; and
at least two sets of punch members in said first die member with corresponding sets of biasing mechanisms and chute means in said second die member;
each of said sets of punch members comprising a pierce punch member, a coin punch member and a knockout punch member;
each of said sets of biasing mechanisms comprising a spring member positioned in axial alignment with one of said coin punch members.

[c9] The progressive stamping die for forming a plurality of products from a work piece in claim 8 wherein said spring member is a gas spring member.

[c10] The progressive stamping die for forming a plurality of products from a work piece in claim 8 wherein said spring member is a mechanical spring member.

[c11] The progressive stamping die for forming a plurality of products from a work piece in claim 8 wherein said biasing mechanism further comprises at least one anvil member.

[c12] The progressive stamping die for forming a plurality of products from a work piece in claim 11 wherein each of said anvil members comprises a puck member, a bottom disk member, a bottoming member, and a return pin member.

[c13] The progressive stamping die for forming a plurality of products from a work piece in claim 8 wherein each of said chute member comprises a scrap chute at least in part in axial alignment with said piece punch member and a product collection chute in axial alignment at least in part with said knockout punch member.

[c14] A method of forming a metal ring member from a work piece with a progressive stamping die, said method comprising the steps of:
positioning a work piece between a first stamping die member and a second stamping die member;
forming an opening in said work piece with pierce punch member;
indexing said work piece in said die member with at least one pilot member;
forming an annular ring member around the opening with a coin punch member, said annular ring member having a predetermined thickness and flat planar dimension by use of a biasing mechanism in axial alignment

with said coin punch member; and
removing said formed annular ring member from said die with a knockout punch member.

[c15] The method of forming a metal ring member from a work piece with a progressive stamping die in claim 14 wherein said biasing mechanism comprises a gas spring mechanism.

[c16] The method of forming a metal ring member from a work piece with a progressive stamping die in claim 14 wherein said biasing mechanism comprises a mechanical spring member.